



# Energy Briefs

Helping the Homeowner Live Energy Efficiently

## Selecting a New Water Heater

Many homeowners wait until their water heater fails before shopping for a replacement. Because they are in a hurry to regain their hot water supply, they are often unable to take the time to shop for the most energy-efficient unit for their specific needs. This is unfortunate because the cost of purchasing and operating a water heater can vary greatly, depending on the type, brand and model selected, and on the quality of the installation.

To avoid this scenario, you might want to do some research now -- before you are faced with an emergency purchase. Familiarize yourself today with the options that will allow you to make an informed decision when the need to buy a new water heater arises.

### Types of Water Heaters Available

Within the last few years, a variety of water heaters have become available to consumers. The following types of water heaters are now on the market: conventional storage, demand, heat pump, tankless coil, and indirect.

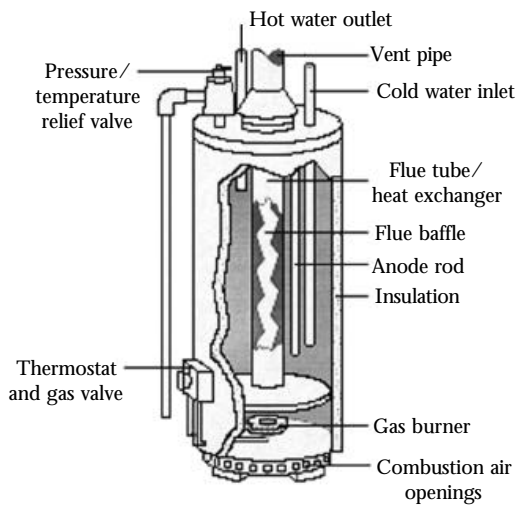
It is also possible to purchase water heaters that can be connected to your home's space-heating system, as well as solar water heaters.

### Storage Water Heaters

A variety of fuel options are available for conventional storage water heaters - electricity, natural gas, oil and propane. Ranging in size from 20 to 80 gallons, storage water heaters remain the most popular type for residential heating needs in the United States. A storage heater operates by releasing hot water from the top of the tank when the hot water tap is turned on. To replace that hot water, cold water enters the bottom of the tank, ensuring that the tank is always full.

Because the water is constantly heated in the tank, energy can be wasted even when no faucet is on. This is called standby heat loss. Newer, more energy-efficient storage models can significantly reduce the amount of standby heat loss, making them much less expensive to operate. To determine the most energy-efficient model, consult the EnergyGuide label required on storage water heaters. EnergyGuide labels indicate either the annual estimated cost of operating the system or the energy efficiency ratings.

Storage Water Heater



Storage water heaters remain the most frequently used type of water heater for residential purposes.

South Carolina Energy Office \* 1201 Main Street, Suite 1010 \* Columbia, SC 29201  
(803) 737-8030 \* 1-800-851-8899 \* Fax (803) 737-9846 \* <http://www.energy.sc.gov>

colder months, the tankless coil works well because the heating system is used regularly. However, the system is less efficient during warmer months and in warmer climates when the boiler is used less frequently.

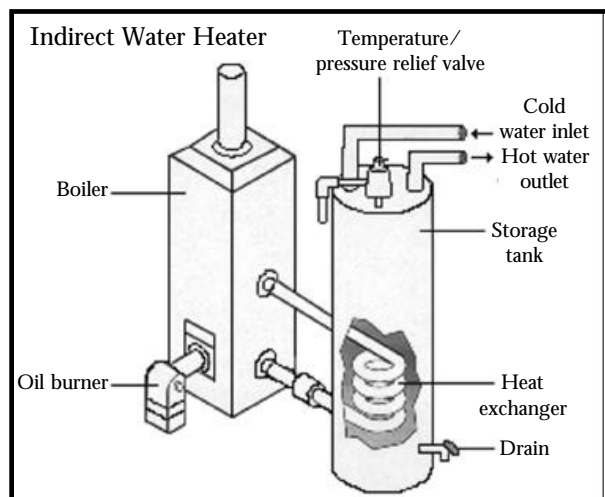
A separate storage tank is required with an indirect water heater. Like the tankless coil, the indirect water heater circulates water through a heat exchanger in the boiler. But this heated water then flows to an insulated storage tank. Because the boiler does not need to operate frequently, this system is more efficient than the tankless coil. In fact, when an indirect water heater is used with a highly efficient boiler, the combination may provide one of the least expensive methods of water heating.

### Criteria for Selection

As with any purchase, balance the pros and cons of the different water heaters in light of your particular needs. There are numerous factors to consider when choosing a new water heater. This publication has already described different system configurations. Some other considerations are capacity, efficiency and cost.

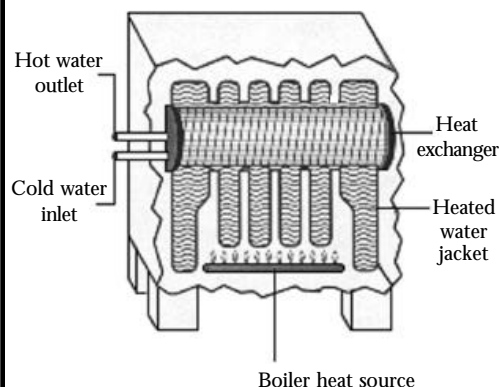
### Determining Capacity

Although some consumers base their purchases on the size of the storage tank, the peak hour demand capacity (referred to as the first-hour rating (FHR) on the EnergyGuide label) is actually the more important figure. The FHR is a measure of how much



A combination of an indirect water heater and a highly efficient boiler can provide a very inexpensive method of water heating.

### Tankless Coil Water Heater



A tankless coil water heater uses a heat exchanger in the boiler to heat water.

hot water the heater will deliver during a busy hour, and it is required by law to appear on the unit's EnergyGuide label. So before you shop, estimate your household's peak hour demand and look for a unit with an FHR in that range.

Gas water heaters have higher FHRs than electric water heaters of the same storage capacity. Therefore, it may be possible to meet your water-heating needs with a gas unit that has a smaller storage tank than an electric unit with the same FHR. More efficient gas water heaters use various nonconventional arrangements for combustion air intake and exhaust. These features, however, can increase installation costs.

### Rating Efficiency

Once you have decided what type of water heater best suits your needs, determine which water heater in that category is the most fuel-efficient. The best indicator of a heater's efficiency is its Energy Factor (EF), which is based on recovery efficiency (i.e., how efficiently the heat from the energy source is transferred to the water), standby losses (i.e., the percentage of heat lost per hour from the stored water compared to the heat content of the water), and cycling losses.